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REVIEWS

RECENT BOOKS ON PHYSIOGRAPHY

Rivers of North America. A Reading Lesson for Students of Geography and Geology. By ISRAEL C. RUSSELL. Pp. 326. G. P. Putnam's Sons, 1898.

Earth Sculpture, or the Origin of Land-Forms. By JAMES GEIKIE. Pp. 397. G. P. Putnam's Sons, 1898.

Physical Geography. By WILLIAM MORRIS DAVIS, assisted by WILLIAM HENRY SNYDER. Pp. 428. Ginn & Company, 1899

These three volumes deserve the careful attention of teachers and students of physical geography and geology, not only in secondary schools, but in colleges as well. Some of them should also appeal to a large class of readers who are lovers of nature, though their work is not in educational lines.

Professor Russell's book is well described by its explanatory title, "A Reading Lesson for Students in Geography and Geology." In this volume the author has presented in readable form the leading processes and principles involved in the history of rivers. In addition, he has introduced, as the title suggests, much descriptive matter concerning the rivers of our own continent. The matter is not too technical for the high school student who is serious in his work, and will be read with profit by college students who have rarely had a physiographic topic so well presented on the printed page.

The scope of the book is in a measure indicated by the headings of the various chapters: The Disintegration and Decay of Rocks; Laws Governing Streams; Influence of Inequalities in the Hardness of Rocks on Riverside Scenery; Material carried in Suspension and in Solution; Stream Deposits; Stream Terraces; Stream Development; Some of the Characteristics of American Rivers; The Life History of a River.

In treating of these various topics the author has made no attempt to be exhaustive, for the book has been prepared, not for the professional geographer, but for the general student who has had too little readable matter at his command. The advanced student may wish that the book were fuller and more explicit at some points, while others into whose hands it will fall, will wish it more elementary. Such infelicities are not to be avoided, and it would have been difficult, on the whole, to have made a better selection of material. Important topics have not been omitted, and unimportant and irrelevant ones have not been introduced. Throughout the book the modern nomenclature of rivers has been used, and on this account those who have not followed the progress of geographic science during the last ten years will find it to their advantage to read the book in course, rather than otherwise.

The volume has some effective illustrations, though their number is too small (17 plates and 23 figures in text), which add to its otherwise attractive appearance.

Professor Geikie's volume deals with the processes involved in the development of topography, and with the results which these processes have effected. The first chapter is devoted to a general discussion of the agents of denudation. The principles and processes of denudation are then studied with immediate reference to land masses affected by various types of structure. The topographic forms developed in regions of horizontal strata at various stages in the progress of denudation and under various conditions are first considered. The same principles and processes are then applied to regions where the strata are inclined, and the topographic results under these conditions are described and illustrated, as in the preceding case. Passing from the more simple to the more complex, the effects of denudation in regions of folded and highly disturbed strata are next set forth, and numerous cuts are introduced illustrative of the more complex topographic forms which result from denudation where the stratigraphy is complicated.

The consideration of the topographic forms developed by denudation in regions possessed of various types of stratigraphy is followed by a consideration of the topographic effects of faults, and of volcanic and other types of igneous action. Unfortunately the last of these topics is less adequately illustrated than most of the preceding. The lack of illustrations here may be less serious than it would have been elsewhere, since illustrations of the topographic effects of volcanic action are among the most common in our geographies. Nevertheless, the absence of abundant illustrations seems to us a defect.

Following the discussion of these topics, a chapter is devoted to the topographic features which depend for their existence upon the character of the rock rather than upon the position of its beds. The topographic effects of structure other than stratification and the results of the varying composition of rock are considered.

To the topographic effects of glaciation two chapters are given, and while the text is clear, no virtue which it possesses can compensate for the entire absence of cuts illustrative of the points described. Nowhere are illustrations more needed, and in no field are they more easily obtained. The topographic effects of eolian action, involving a brief consideration of dunes and of rock sculpture effected by the wind, and of the surface effects of underground water, are next considered. In the case of the last topic, illustrations are again altogether wanting.

A chapter is given to the discussion of basins (depressions without outlets), and illustrations showing the real nature of basins are introduced which will tend to correct the prevalent erroneous notions concerning the shape of these topographic features. The topography of coast lines is briefly discussed, and too meagerly illustrated. It is with regret that the lack of illustrations is repeatedly referred to, but in a book of this sort, which deals almost exclusively with the forms of the surface, the lack of illustrations is especially serious.

The volume closes with a classification of land forms. It is to be especially noted that the classification comes in the right place, after (and not before) a consideration of the processes of earth sculpture and their results, and therefore when the reader is for the first time in a position to appreciate the force and the meaning of the classification. This is a point which the writers of books intended to be educational would do well to note. Many of our text-books are lumbered with elaborate synoptical classifications preceding the discussion of the things which are classified. When the classification in such positions is reached by the student he has no comprehension of its meaning, and too often does not refer to it after the chapter is read.

In spite of the one notable defect which has been referred to, Professor Geikie's book is to be heartily commended to students and teachers of geography.

Professor Davis's book differs from the others in being a text-book. The author has followed traditional lines to the extent of including in the volume a consideration of the atmosphere and the ocean as well as the land; but he has departed from traditional lines in according to the former topics but brief treatment, while the larger part of the book is devoted to the geography of the land. The author is understood to believe that the subject of meteorology should be separated from that of physical geography (of the land) and pursued as a distinct subject in the secondary schools. Whatever may be said of the desirability of this change, it is not likely to come about at present, and for a good while to come such attention as is given to meteorology in the secondary schools is likely to be in connection with physical geography. If this be true, the consideration of the atmosphere in this volume seems to us too brief; on the other hand, the selection of material is excellent, and in so brief a space it would have been difficult to present a more satisfactory outline of the subject. The inadequacy of the treatment, however, appears to be recognized by the author himself, who indicates that it should be supplemented by "local observations and by the construction and study of weather maps." Brief appendices give some suggestions for this observational and constructional work, but the average teacher in the secondary school will find these suggestions still more inadequate than the text they supplement. Much fuller directions will need to be given to teachers in the secondary schools before the majority of them can direct the sort of work which Professor Davis rightly advises.

The consideration of the ocean is likewise exceedingly brief (34 pages). Both the selection of material and its presentation are excellent, but the small amount of space devoted to the subject is insufficient to give even all the important points with which the student of the subject, even in an elementary way, should be acquainted.

As already noted, the larger part of the book is devoted to the consideration of the land surfaces, and it is not too much to say that the geography of the land is presented in an essentially new light. Here traditional lines are not at all followed, and no one whose knowledge of the subject has been derived from other text-books can read this without learning much concerning the subject and concerning the methods of presenting it. The descriptive element enters more largely into this volume than into most recent books on physical geography. Topographic types are illustrated by descriptive references to specific areas, many of which have not been well known to professional geographers. In other words, concrete illustrations of general types abound, and they are drawn from wide sources and are definitely pictured.

Plains, plateaus, and mountains as topographic types are considered in order, and many illustrations of the various phases of these general types, drawn from all parts of the world, are introduced. The treatment of coastal plains is especially happy. The question might be raised whether the idea of the coastal plain is not carried rather far when, under the heading of "Ancient Coastal Plains," areas very distant from the sea, and which now have nothing to suggest their "coastal" relations, are discussed. Thus "the ancient coastal plains" of Wisconsin seem to us a little remote for consideration in an elementary physical geography. The teacher who is a geologist as well as a geographer will know how to treat this subject; but it seems to us likely that the text will fail to convey the right notion of these "ancient coastal plains," which are no longer coastal plains, to many pupils if not to many teachers.

The important chapters on Rivers and Valleys is excellent, and should prove effective with classes if they have the guidance of skillful teachers.

A significant chapter of the volume is entitled Climatic Control of Land Forms. Here are considered such topics as the effect of climate on streams and their work; salt lakes; the life of arid regions; glaciers and ice-sheets and their work. It must be confessed that the fashioning of the land surface by the continental ice-sheet of North America seems doubtfully placed in a chapter with the above title, for while glaciation was of course a result of the climate of the time, the topography which the ice fashioned is as really the work of the ice as the topography developed by rivers is their work; and it can hardly be said that glaciers and ice-sheets are more directly controlled by climate than rivers are. The discussion of glacial topography under the caption of Climatic Control of Land Forms, therefore, seems to us not the happiest possible arrangement. The volume closes with an excellent chapter on Shore Lines. Numerous brief appendices are added which will be helpful to the teacher of the subject.

Throughout the volume emphasis is laid on the effects of geography on human development, and references to historical incidents, as influenced by topography, are frequent. This is a phase of the subject which is most welcome.

In a book which is so thoroughly good it may seem gratuitous to mention defects, but there is one which seems to us somewhat serious. There is an occasional lapse into an obscure style, resulting from the introduction of ideas for which adquate preparation has not been made, or from the two brief exposition of complex phenomena. The result is that the pupil, if not his teacher, will sometimes be staggered. From actual experience with a group of teachers, it has been found that a large proportion of them do not catch the idea of a *cuesta* (p. 133), and it is not easy to see what good purpose the introduction of the term serves, *for the pupils who will use this volume.* The defect referred to above will, it is to be feared, interfere with the usefulness of this very excellent book.

The volume is abundantly illustrated (261 figures and 10 plates) and every illustration is to the point. Half-tones have been excluded, and engravings put in their place. There can be no question but that in most cases the engravings are much more effective than reproductions directly from photographs, for the non-essential features are omitted, and the essential features brought into prominence. We have seen no text-book on this subject in which the illustrations so uniformly illustrate the exact points which they were meant to illustrate, and in such a way that their meaning cannot be mistaken.

The three volumes mentioned above put new and rich resources into the hands of teachers and students of physiography, and should result in great improvement in the teaching of the subject.

R. D. S.

Transactions of the Kansas Academy of Sciences, 1897–8. Vol. XVI.

This volume of 320 pages indicates a laudable degree of activity in various scientific lines. The presidental address by Dr. S. W. Williston on " Science in Education " is an admirable exposition of the existing status and current tendencies of education in liberal and professional lines and contains excellent suggestions relative to desirable changes in which science shall be a larger factor. The papers in geology and paleontology are six in number as follows: Physiography of Southeastern Kansas, by George I. Adams; *Fusulina cylindrica* Shell Structure, by Alva J. Smith; New Developments in the Mentor Beds, by A. W. Jones; Fossil Turtle Cast from the Dakota Epoch, by C. S. Parmenter: Deep Well at Madison, Kan., by F. W. Bushong; Correlation of the Coal Measures of Kansas and Nebraska, by J. W. Beede.

T. C. C.